

D. FOLSOM

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POTATO DUSTING AND SPRAYING COMPARISONS IN MAINE

Donald Folsom

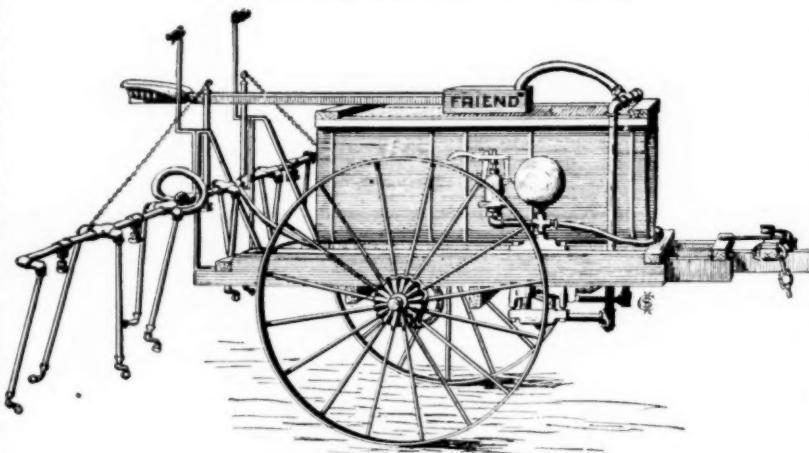
During the last few years copper fungicides have aroused much interest in many places. This has been largely relative to a comparison of dusting and spraying, using modern materials and methods. Such comparison of dusting and spraying in experimental plots had its beginning, as far as Maine is concerned, in 1922 in Aroostook County.¹ This was a result of marked popular interest in the problem. This popular interest subsided after one summer about as quickly as it arose, professedly on account of the high cost of dusting materials. However, the experimental work was continued. The chief purpose of this experimental work has been to make some advance in solving the grower's riddle, "Shall I spray, or dust, or neither, under a given set of conditions?" In 1922 each of these three procedures was vigorously advocated by certain growers as their general permanent policy. Others tried to adapt the procedure more or less to the season, as to how much fungicide, if any, to apply. Some of the more interesting conclusions reached in the course of the experimental comparisons are given below. The reader should bear in mind that this work was done in the extreme northeastern corner of the United States, at the latitude of the cities of Quebec, Sault Ste. Marie, Duluth, Fargo, Helena, Moscow (Idaho), and Pullman (Washington).

Earlier maturing associated with early blight and flea-beetle injury does not necessarily reduce the yield, and may not reduce it as much as is expected from the foliage injury. In two comparisons in 1922, in different localities, dusting did not delay maturing as effectively as spraying and yet the yields were alike. In 1923 the

1 Previous work, reported in the Proceedings of the Potato Association, was done in regulatory test plots of the Federal Insecticide and Fungicide Board.

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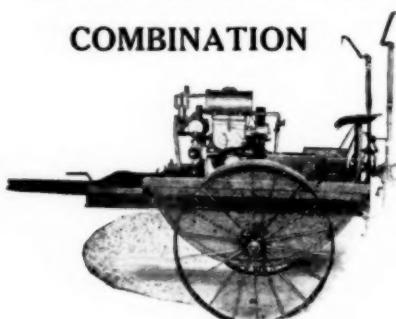
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plots in one test were triplicated, giving clear-cut results in each of two varieties. Here the untreated control plots had the most early blight while the sprayed plots had very little. However, the control plots yielded significantly more, giving 411 bushels an acre as against 353 bushels for the sprayed plots, a difference of 58 bushels an acre.

Spraying with Bordeaux mixture does not necessarily increase the yield through copper stimulation. In the 1923 test described in the preceding paragraph, the early blight mentioned was the only cause of injury in the untreated controls. Late blight, flea beetles, potato "bugs", and leafhoppers were all absent. Frost killed the tops soon after a difference in early blight had developed. The great decrease in yield associated with spraying in this year's test confirms certain work done elsewhere and points to the necessity of a long growing season for the demonstration of true "copper stimulation" as distinguished from the control of hopperburn, etc.

Large yields are possible without spraying. In 1889 in Aroostook County, before spraying with Bordeaux mixture was even heard of there, a prize from a fertilizer company was earned from a yield of 738 bushels an acre. The yield of 411 bushels an acre in the 1923 test described above, is an example from modern times. The latter was a duplicate of results recorded on the same farm in 1921.

Late blight may be checked by coolness. Weather with a mean temperature of from 65 to 70 degrees F. is described as "cool" in some regions but is considered to be "warm" in Aroostook County. In a number of potato regions it is the occurrence of "cool", moist weather that brings fear of a late blight epidemic. In Aroostook County it is "muggy" or comparatively warm, moist weather that brings the same fear, and a drop in temperature even when accompanied by a rainy spell brings a sigh of relief. This opinion, a result of practical experience, is confirmed by the available records as to weather and diseases.

Aroostook County conditions do not necessarily favor late blight or large gains from spraying. This has already been shown by previous publications of Cook and Wallace. As shown in the preceding paragraph, coolness may check late blight. There are probably other inhibiting factors such as the moderateness of the normal rainfall, the quick drying of the soil, and the clear days and drying winds that are common. A ten-year average gain of 21 bushels over a control-plot yield of 328 bushels is on record for 1916 to 1925, in the Green Mountain variety. This is not a large gain when compared with that obtained in similar tests in certain other regions. Its smallness may be attributed to the absence of leafhoppers and hopperburn, to the early fall frosts reducing the value of "copper stimulation", to the lack of severe early blight, and to the absence of flea beetles in some seasons. The well-known vigor of Aroostook potato plants may also contribute to the lack of a large gain in these tests, and it certainly reduces the relative

or percentage value of the absolute or bushel gain. The available economic statistics give a normal lower farm price per bushel in Aroostook County than in most potato regions where spraying is considered important. This tends to make economical and efficient spraying or dusting methods more essential here, to compensate for the greater difficulty of getting a handsome profit from spraying or dusting. It may be pointed out here that a year of severe late blight in one region is not necessarily a year of low yields and high prices for all potato regions together, so that a large gain from spraying may occur in a year of low prices. Reversely, a small gain may occur in a high-price year and so bring a good profit. A long term of years is needed for reliable conclusions.

The value of spraying differs with the season and with the locality or field. Variation from loss through spraying on the one hand, to a complete salvation of the crop through spraying on the other hand, is to be noted in the mass of reports from various regions. In 1889, in most of Maine, in the first part of August late blight killed most of the plants when the tubers were only about half grown, but in Aroostook County the disease appeared later and in spite of it a heavy crop was harvested. The prize yield of 738 bushels in that year has been referred to in a previous paragraph. In 1925, on July 30, in one field in central Maine, late blight had destroyed about a third of the foliage — that on the lowest part of the plants — and had girdled many of the stems near the ground. This field had received about 100 gallons of Bordeaux mixture per acre. In the same season in northeastern Maine our unsprayed plots had much less late blight on the foliage by August 20, after which the disease was checked by clear, dry days. Even in these plots the rot varied with the soil and typography.

A comparison of dusting and spraying is influenced by variation in environmental conditions. There are not only the direct effects on the value of both spraying and dusting, but in addition certain conditions may influence spraying and dusting differently. An experimental comparison demands at least that dusted and sprayed plots be replicated and alternated in the same area, and that dust and spray applications be like each other in some respects such as number, dates, and the amount of metallic copper applied. For dusted plots as well as for sprayed plots, net profits should be determined. By this is meant the difference between the costs of materials and of their application on the one hand and the resulting increase in income on the other hand. In our experimental plots in 1923, spraying reduced the yield more than dusting did. In 1924 spraying gave a greater yield increase than dusting. **In four years' comparison on one farm in one variety (Green Mountain) the increased gross return has been the same,** the cost of dusting has been greater with equivalent metallic copper because of the cost of factory-mixed materials, and the range of yield has been less with spraying. A smaller range of yield means a more economical use

of harvesting and storage equipment. It has been hard sometimes to get freedom from wind for dusting. Although calmness of the air is more necessary for dusting in alternating plots than in commercial fields, the prevalence of wind during daylight does not permit the best use of dust materials. Wind in Aroostook County sometimes prevents much of the spray from striking the vines and plot dusting was once postponed day by day for a week because it was impossible even at daybreak, when it was least windy. In the last two seasons on some farms the wells and other sources of water ran dry, making spraying difficult.

A grower can not make a wise decision on the basis of experimental tests alone especially when they are conducted on another's farm, or are conducted for a period of less than ten years. Experiments are of some use. They can develop somewhat reliable methods of testing. They can furnish plausible explanations and interpretations of results got in commercial fields. If accurately conducted and repeated often enough as to season and place, they can serve to indicate the general results to be expected under apparently similar conditions. Extension demonstrations are more useful in some ways although of necessity they often are less thorough for a given field and often are designed for convincing others rather than for determining the facts and their probable representativeness. A grower who wants to get the most profit from dusting or spraying needs not only to be familiar with the results of experiments and demonstrations, especially with those in his own locality. He needs also to study the problem as a conscious experimenter, to learn what the average results are for ten or more years on a given farm or field of his own, and to determine what expectations these average results justify from spraying or dusting with the existing methods and prices. Otherwise the grower is experimenting unconsciously, the results being merged with the other factors of success and failure in the potato game as a whole. It is by analyzing the work of potato growing and strengthening the weak factors that success can be more nearly assured.

NEBRASKA SEED POTATO SPECIAL

Val Kuska, Colonization Agent, Omaha, Nebr.

A special train of 40 cars of seed potatoes from Box Butte and Dawes counties, 22 cars of sugar and 8 cars of dried sugar pulp from the North Platte Valley was assembled at Alliance, Nebraska, January 21, 1926, by the Burlington Railroad, and scheduled for the Sunny South to advertise the quality and quantity of the products of Nebraska. The train was valued at \$163,360, and was met by thousands of people at various stops on its way to the South.

At Lincoln, Nebraska, the train was greeted by an enthusiastic

crowd composed mostly of members of the Real Estate Board, the Chamber of Commerce, and the College of Agriculture. On account of the pessimistic reports regarding Nebraska's outlook the Lincoln Real Estate Board decided to prove to the people of Nebraska, and the rest of the world, that there is a market for Nebraska's products by staging an auction sale, with Col. Al. Forke in charge.

Colonel Forke said that as there were many people in Nebraska who seemed to have a pessimistic outlook for Nebraska, and who did not think the products would find a ready market in the South, or any place outside of Nebraska, the Lincoln Realtors were requested by some of these pessimists to sell the trainload to the highest bidder for cash. In spite of the opposition of one of the pessimists present, who cautioned the people that the farmers were going to the dogs, and that Nebraska products could not expect to have a market, several bids were made.

A representative of several of the largest insurance companies in the East said that they had loaned money on Nebraska for thirty years and their losses had been very small. He wanted to buy the trainload of products to send back East to the money lenders to show them the high quality of Nebraska products so that they would have renewed confidence in loaning their money. One man said that he wanted to buy the trainload to send to California to make former Nebraska residents homesick for their old home state. Another bidder, who claimed to have made his money in Nebraska, got the Florida fever, but after going there became cured and returned to Nebraska, raised his bid on the trainload because he wanted to spend his money in Nebraska.

Professor Werner, Specialist in Nebraska Products, was called upon to give some facts on the Nebraska potato industry. He said that Nebraska certified seed potatoes are a high class product, and have given satisfaction wherever they have been planted; that they are gaining favor in the South because they produce greater yields than potatoes grown in the Northeastern seed potato producing sections, and this year will be planted in about twelve southern states; that they have been bought by growers in California, Utah, Minnesota, and Colorado; that about 125,000 bushels, or 250 car-loads, of seed potatoes grown in 1925 were certified by the Nebraska Certified Seed Potato Growers Cooperative, working in conjunction with the Agricultural College, and that figured conservatively, this crop is worth over a quarter million dollars.

After listening to the statements made by the bidders, and to the facts and figures on the Nebraska Potato Industry by Professor Werner, the pessimist was won over, and overbid all the former bids, purchasing the trainload of products for \$550,000, saying that he wanted to send the train to the Sunny South, and establish a permanent market for Nebraska products, and then to bring the train back to Nebraska and return it to General Manager Flynn

of the Burlington Railroad that they might continue to maintain their high standard of service to the farmers, as well as all the people of Nebraska.

Colonel Forke was greatly impressed with the response received at this auction and reminded the people that it was their duty to continue this spirit of optimism and cooperation; that they should give assistance in all lines which ultimately tend to help in the production of not only more, but better agricultural products, and prove to the world that Nebraska does have what the people require in their every day lives.

That the high quality of western Nebraska seed potatoes has found a steady demand in the South can best be evidenced by its growth.

"The southern demands were developed through the cooperation of Boys and Girls Potato Clubs of Louisiana. At different times the western Nebraska Certified growers have furnished free to these club members several cars of certified seed for demonstrational purposes, and the Burlington assisted by transporting this stock free of cost. As a result of this work with the Boys and Girls Clubs, in 1921, Louisiana secured 10 cars of western Nebraska seed. In 1922, they secured 40 cars and in 1923 the demand was increased to 200 cars.

"A number of trips have been made by the Agricultural Department of the Burlington to the potato sections of Texas, Louisiana, Oklahoma, Arkansas, Alabama, and Mississippi for the purpose of interesting growers in those districts in securing their certified seed potatoes from our western territory. Three years ago one car of Nebraska seed was shipped to southern Alabama; the following year, 8 cars were shipped, and last year 29 cars. More than 50 cars of seed have already been purchased this season by growers in this section from Nebraska."

The train created widespread interest all along its southern route, and moved special to Shreveport, Louisiana, where the cars were diverted to various points in the South. It is reported that a number of southern potato growers are arranging to visit Northwest Nebraska to study methods of potato culture there.

DEVELOPMENT OF THE POTATO INDUSTRY IN BRITISH COLUMBIA

J. B. Munro, Assistant Agronomist, Victoria, B. C. Canada

The story of the spud is the story of the development of agriculture in British Columbia. For over a hundred years the Irish potato has been a staple crop in this province. The first tubers were planted west of the Canadian Rockies at Fort St. James, B. C.

by the late Daniel W. Harmon, a partner in the old Northwest Company, in May 1811. The first potato harvest recorded in the annals of the provincial archives was at Fort St. James, in October 1816, when Mr. Harmon secured a yield of forty-one bushels from one bushel planted the preceding spring.

The growing of potatoes is referred to over and over again in the records of the early life of the British Colony on the Pacific coast. Wherever a settlement was made between the Columbia river and the Alaskan boundary potatoes were planted. The soil and climate were admirably suited to the production of this crop and as early as 1851 Sir James Douglas foretold the development of an export trade in potatoes. His predictions were doubtless based on the practical results on the Olf Farm at Fort Victoria, the site of our capital city. Here in 1847 a yield of 3000 bushels was secured and in 1848 the harvest totalled 2100 bushels, according to the report of Sir J. H. Pelly addressed to Sir George Simpson in the latter year.

The possibility of a surplus production of tubers in the Victoria district appears in the letter Sir James Douglas wrote to Earl Grey on October 3rd, 1851 in which he says "The potato crops will greatly exceed our annual consumption, and the potatoes are remarkably large and of good quality. The natives generally are turning their attention to the cultivation of the potato . . ." And his prediction was justified for last year in the farming section adjacent to Victoria close to 100,000 sacks of tubers were harvested, but his prophecy is not fulfilled for in the same year Victoria dealers imported 67,664 sacks of potatoes from the mainland, the United States and up-island points.

The statistics of sixty years ago record the planting of sixteen and a half acres of potatoes at Nanaimo, and the harvesting of 5200 bushels in the Chilliwack district. Alexander Caulfield Anderson, in his report of half a century ago emphasizes the importance of selecting suitable locations for potato growing on the Pacific slope, while many other early writers refer to the importance of this crop in the Saanich peninsula. The authentic records of the provincial archives present the story of the progress of potato growing interwoven with the general development of New Caledonia.

The recent advance of the potato industry in British Columbia stands out in bold relief against the arduous progress of more than a hundred years. Since 1920 the complexion of the potato industry has been altered. It has become a specialized business rather than a branch of farming. Seed production at least is on a systematic basis and science has come to the aid of the growers. Spuds are no longer spuds. They are either Certified seed or they are Commercial potatoes. As commercial potatoes they fall into one of the classes recognized by the Canadian Government, viz,—Canada "A", Canada "B", or Canada "C", and they are marked accordingly before they can be marketed. They are subject to official inspec-

tion by Dominion Government officials, and it is a sorry day for the vendor if he is found trifling with the federal regulations. Deliberate violations are few and far between and even mistakes are growing less each year in the grading of commercial potatoes.

Certified seed potato growing is a branch apart from the commercial potato production. It is a specialized industry that can be undertaken and carried through only by those who are competent to produce a quality product and willing to devote close attention to the details of the business from start to finish. This industry necessitates thoroughness in preparing the land, the selection of a suitable variety that has a pedigree behind it, adequate isolation from other potatoes, knowledge of varietal characteristics, ability to recognize diseases even in their incipient stages and the immediate removal of affected plants. There are no half-way measures in the growing of certified seed potatoes. The inspectors may be jolly good fellows outside of business hours but when they made their inspections the crop is either passed or rejected on its merits; there is no sentiment and no extension of time to rogue out the odd offending plant. Time was, in the early days of certification work, when the inspector could take time to make several calls on a delinquent grower and give him the benefit of an extended visit each time. Those visits are no longer possible because of the expansion of the industry that now takes in practically the whole of British Columbia. A few years ago the inspectors went out to educate the growers, now they go out to inspect the crops.

But the education of the growers is not neglected. They are all members of the local branch of the British Columbia Certified Seed-potato Growers Association that was organized at Victoria in November 1923, and through the locals the members are kept informed regarding their business. This association was in process of formation for several years but in the fall of 1923 when representatives of the growers throughout the province met at Victoria on the invitation of the provincial department of Agriculture final organization was achieved. George Stewart of Keating, a pioneer of the Saanich district, was elected president and C. Tice, Chief Agronomist of the Department of Agriculture, was made secretary. The president was succeeded by W. Wallace Duncan of Brentwood Bay who has been re-elected to serve another year as first officer of the Central executive. On account of the pressure of official duties, Mr. Tice, who has charge of the Field Crop work of the province, was forced to resign his position as secretary in November last and Capt. G. Robert Bates of Courtenay was appointed in his stead. Both Mr. Tice and George Stewart have been retained on the directorate.

The growth of the potato association has been similar to that of the potato industry,—rapid and consistent. Under the supervision of the Central are thirty Locals with a membership of more than three hundred growers of certified seed potatoes, who have

paid their fees, lived up to the association's requirements and planted five hundred acres of certified seed in 1925. The prospects for 1926 indicate further growth and increased stability.

The objects of the organization are many and include the problems of transportation, storage, marketing, advertising, standardizing of varieties, selection of suitable containers for domestic and export trade, etc. The advertising problem was attacked last spring in a practical way. The association donated several tons of the leading varieties of certified seed potatoes and the provincial department paid transportation charges on them to several potato growing sections of California and Oregon where they were tested out in fields along with southern grown seed. The results of this experiment in advertising are still coming in from the South. The value of it was revealed when one of the experimenters personally came to British Columbia following the harvesting of the crops from northern and southern grown seed and bought up five carloads of seed potatoes of the variety that gave the best yield on his farm.

Last year's experiment in advertising is being followed by another experiment. This experiment has to do with the selection of the right container for the export trade. Two carloads of the seed potatoes have been shipped from the Comox Valley in new sacks holding 100 pounds each. Three cars are now being loaded with the potatoes packed in eight-sided crates of 100 pounds capacity. Some information of value will result from this departure from the old custom of shipping in sacks only.

A matter that comes before the Central Association at their annual meeting each fall is the setting of price for the crop just harvested. There has been a notion that some underhanded price-fixing is resorted to but this notion has never been entertained by growers of certified seed. They know the value of their product and know the cost of producing the article in question. It is but fair to state that they set the price a little above the cost of production and a lot below the value of the seed. Usually the price is about twenty dollars per ton higher than that of ordinary table potatoes. It varies from year to year with the fluctuations of the commercial grades. In 1923 the growers agreed among themselves to sell their seed at forty dollars per ton, f. o. b. local shipping points. That year commercial potatoes were cheap. The next fall a price of fifty dollars was agreed upon and lived up to by every member of the new organization. In the fall of 1924 potatoes had soared still higher and seventy dollars was the price of certified seed. The 1925 crop is selling at eighty dollars and there will not be sufficient tubers to supply the demand. As the value of certified seed becomes known it will continue to demand a good price. The setting of the price is purely an association affair and it is based on the existing conditions of supply and demand along with cost of production. It is possible that another year the price may vary with the variety for it is known that the cost of production is far greater with some varieties, especially earlies, than with other higher yielding sorts.

THE INSPECTION OF POTATO VARIETIES IN
SCOTLAND

Thomas McIntosh

The degeneration of potato stocks takes place much more rapidly in England than in Scotland. As a result of this a great potato seed trade from Scotland to England has developed. Most authorities ascribe the unsurpassed quality of Scottish seed to its freedom, or comparative freedom, from virus diseases; it is possible, however, that a climatic factor exists and that the lower temperatures of September and October in Scotland produce a better ripened seed than can be obtained in England.

The recognition of the importance of this trade has been a potent influence in the development of potato inspection work in Scotland.

The Board of Agriculture for Scotland originally undertook the inspection of potato varieties as a logical consequence of difficulties arising out of efforts to control the spread of wart disease. One of the principal restrictions imposed on occupiers of infected land is that which forbids the planting of any varieties susceptible to the disease. Theoretically, this restriction should have been effective, were its terms strictly observed. In practice, however, it was found that immune varieties were frequently mixed with susceptible kinds, due largely to the very great number of varieties grown in Scotland. Although the spread of wart disease has never assumed serious proportions in Scotland, it was deemed advisable to promote the production of pure seed of immune varieties and, with this end in view, the Board, in 1918, instituted a voluntary scheme for the certification of crops of these varieties. Later a fee was charged and the scope of the scheme was extended to include non-immune varieties. From the beginning the scheme was popular, but it was undoubtedly strengthened by the wart disease orders, which imposed certain restrictions on the importation into England and Wales of Scottish seed, and by the Seeds Act of 1920, which made it incumbent on the seller of seed of any variety to guarantee a purity of at least 97 per cent.

The success of the scheme may be gauged by the acreage offered for inspection: from 1918 to 1925 this amounted to approximately 270,000 acres; but this figure, although highly indicative, cannot convey an adequate impression of the actual improvement which has taken place in the purity of Scottish stocks: personal experience is the only guarantor of that.

The fee now charged is 2/- per acre with a minimum of 5/-. About sixty inspectors are engaged annually on the work, the inspections taking place during the months of July and August. These inspectors consist of the Board's Inspectorate Staff, as a nucleus, and a large number of students and graduates of the three Agricultural Colleges. The inspectors undergo a severe training prior to

the inspections and all must pass an examination in identifying potato varieties before being accepted. The inspectors work in pairs and at least one of each pair has had previous experience in the work. Districts, including about 130 farms, are allotted to each pair.

The standards of purity recognized are 99.5 per cent and above, less than 99.5 per cent but not less than 97 per cent, and less than 97 per cent.

A special certificate, the Stock Seed Certificate, is granted to crops which satisfy certain demands, viz:—(1) Free from all visible signs of virus diseases (an exception is made with certain varieties), (2) substantially free from all other diseases, (3) 100 per cent pure or almost so, (4) substantially free from such variations in growth as bolters and wildlings and (5) grown in such a way as to reduce the danger of mixture with other varieties to a minimum. Special consideration is given to the locality in which the crop is grown. During the season 1925, Stock Seed Certificates were issued for 326 acres.

The following tables show the acreages of the various varieties inspected in 1925. The inspected acreages amounted in 1924 to about 35 per cent and in 1925 to about 40 per cent of the total acreages planted with potatoes in Scotland.

Summary of Acreages of Potato Crops of the Immune Varieties Inspected for Purity in Scotland during 1925

VARIETIES	Percentage of Purity			TOTALS
	99.5% and above	Below 99.5% to 97%	Below 97%	
Kerr's Pink	9,189½	1,444½	484½	11,118½
Great Scot	3,820¾	939¾	596½	5,357
Golden Wonder	2,590	176¾	131¾	2,898
Majestic	1,880½	391¾	261¾	2,534
Ally	529½	74	25¾	629½
Tinwald Perfection	442	47½	42½	532
Rhoderick Dhu	390¼	35½	39	464½
King George	250	24¾	41½	316½
Crusader	218¾	4¼	13½	236½
Arran Comrade	151¼	24¼	14¾	190¼
Abundance	76½	31¼	48¼	156
Immune Ashleaf	124½	7	4	135½
Arran Victory	110¾		1¾	112½
Witchhill	67¾	18	2¾	88½
Dargill Early	66¾	11½	4¾	83
Others	346¾	80¼	25½	425½
Totals	20,255½	3,310¾	1,738	25,304½

**Summary of Acreages of Potato Crops of the Non-
Immune Varieties Inspected for Purity in
Scotland during 1925**

Percentage of Purity

VARIETIES	99.5% and above	Below to 97%	99.5% Below 97%	TOTALS
King Edward	7,131 3/4	1,995 1/4	882 3/4	10,009 3/4
Arran Chief	2,155 1/2	974 1/4	1,373 1/2	4,503 3/4
Epicure	987 3/4	759	553 1/4	2,300
British Queen	1,009	350 1/2	182	1,541 1/2
Sharp's Express	956 1/4	391 1/2	192 1/2	1,540 1/4
Eclipse	960 1/4	272	163 1/4	1,395 1/2
Field Marshal	923 1/4	132 3/4	14 1/2	1,070 1/2
Duke of York	453 1/4	84	97 1/4	634 1/2
Up-to-Date	368 3/4	48 1/4	44 1/4	462 1/4
May Queen	130	12 1/4	28 1/4	171
Ninetyfold	78 1/2	22 1/4	3	103 3/4
Others	161 1/2	110 1/4	63 1/4	335 1/2
Totals	15,315 3/4	5,153 1/4	3,598 3/4	24,067 3/4

DUSTING POTATOES IN WISCONSIN

James H. Dance, Waupaca, Wisconsin

Wisconsin potato growers have been using the dusting method of applying insecticides and fungicides for many years, but it is only during the last five years that large horse-drawn dusters have come into favor with the better growers. Previous to this time "dusting" consisted primarily in the application of Paris Green for killing bugs, small crank-dusters being used almost entirely. There were few horse-drawn machines in use but they were neither well constructed nor very efficient.

The rapid increase in use of dusters in Wisconsin during the last five years is due to several causes. First of these is the introduction of an efficient type of machine, which was made to last indefinitely and so constructed as to make a thorough application of materials. A second reason is the improvement in dusting materials, and the gradual decrease in price due to increased production by the manufacturers. Next is the interest manifested by the State Department of Agriculture and State Experiment Station, who cooperated in 1924 to make comparative tests of "dusting" with "spraying," the latter having previously proven to be very effective in the repelling of leafhoppers and the control of blight.

Even in years when there are no leafhoppers and blight does not develop it still pays to apply copper in spray or dustform, not alone

for the protection afforded but also for the stimulation of growth which is always enough to cover the cost of materials and application any season. In the season of 1923 the Wisconsin Experiment Station conducted five test plots in various parts of the state to show the value of copper in the form of a spray and, although there were practically no leafhoppers and little or no blight, obtained worth while increases in yield. The writer at this time was County Agricultural Agent for Waupaca County, one of the largest potato growing sections in Wisconsin, and it was his privilege to assist in checking up the yields on plots located in Waupaca County and to observe the use of dusters and sprayers alike on many farms.

By 1924 the Wisconsin Department of Agriculture had witnessed the success of many growers with the modern Copper Lime Dust and decided to determine definitely the effectiveness of this dust as compared to bordeaux mixture in spray form. Three plots were selected in three different counties and the results are shown in the following table, as published in the last Biennial Report of the Wisconsin State Department of Agriculture:—

County	Locality	Variety	Dusted	Sprayed	Check
Barron	Brill	Rural New Yorker	359	327	285
Price	Prentice	Rural New Yorker	253	240	194
Oneida	Rhinelander	Green Mountain	172	156	132

The report contains the information further that there were few leafhoppers present, and that the increased yields were due largely to control of early and late blight and stimulation of the plants by bordeaux. The spraying was done with a Yellow Jacket traction sprayer equipped with three nozzles per row. Applications of 4-4-40 Bordeaux mixture were made at ten day intervals, each application averaging from seventy-five to ninety gallons of material per acre. The dusting was done with a Niagara Duster, the material used being "D-18. Mixture," a Copper Lime Dust containing Calcium Arsenate, manufactured by the same company. The dust application averaged twenty-five pounds per acre for each application.

In 1925 a number of the largest potato growers in Wisconsin purchased dusters and have advised the writer that they are exceptionally well pleased with the dusting method, and find it a great labor saver and efficient in control of disease and insect pests.

WHY I USE THE DUSTING METHOD ON MY POTATO CROP FOR THE CONTROL OF INSECTS AND THE PREVENTION OF DISEASES

Willis W. Gibbel, Brunnerville, Lancaster County, Pa.

Potatoes have been my main money crop ever since I have been at farming for myself. As this brief article has to deal with the

control of insect pests and diseases attacking the potato crop I think it best that those pests be enumerated which attack the crops in my particular locality. I presume other potato growers have about the same contention as we experience in Lancaster County, Pennsylvania.

The principal insects bothering us are the flea beetle, the Colorado potato beetle, aphis, leafhoppers, and the potato tarnish bug. Our diseases preventable by spraying or dusting processes are early and late blights.

During the first eight years of potato spraying I started with the old method of merely dusting, then spraying Paris Green on the vines to kill the bugs. This process killed a large percentage of the insects when much time and labor were expended, but the vines were always subject to being burned. This was due, I learned, by the always uncertain amount of water soluable arsenic present in Paris Green. Being dissatisfied with this method I decided to do the job as near right as could be done in those days. I purchased, a sprayer maintaining one hundred and fifty pounds pressure and covering four rows, with one nozzle for each row. I worried with this rig for almost three years and found that even if the thing was working properly I was merely "sprinkling" the vines. About this time our State College Extension Department began teaching the value of real spraying. Showing us, by actual demonstration, how we could be sure of killing the bugs and preventing the blights, and in the bargain, increasing our crops by many bushels per acre. This was indeed interesting and a profitable practice. It became necessary for me to buy a new sprayer and after looking over the best machines obtainable, I centered on a good standard make which would maintain at least two hundred and fifty pounds pressure, and which had a four row adjustable boom, with three nozzles for each row. With this outfit I was able to put on about one hundred and twenty-five gallons of spray to the acre, and get it on in the right manner. That kind of spraying proved to be very profitable. I was able to fully control the insects and prevent the blights and increase the yields. The sprayer was excellent when it worked, even though the application was in itself very slow. The materials which most of the farmers used then were a home made mixture of Bordeaux, 4-4-50 and arsenate of lead and nicotine sulphate.

After a few seasons this machine gave me endless trouble, such as clogging of nozzles and replacement of pump packings, even though I was always particular to keep the machine clean. Finally it became necessary for me to buy a new outfit.

Three years before this the dusters came into use for this particular work of control. None of these were brought into our county but some to a nearby county and I had the opportunity to see these at work. After seeing those early models work and following up the results I concluded that I did not want to "take a chance" with

the duster for my potatoes. But when it became necessary for me to buy a new outfit I looked over the field of dusters and into this new method and I found that rapid strides had been made. That the machines, in themselves, were more powerful and distributed the dust evenly and finely over and underneath the leaves and stems and in general, were mechanically correct. The next investigation was into the dusting materials. I learned from growers who were using them, that the materials were made vastly different from those used a few years ago. That by using a certain poundage to the acre the farmer would apply the equal of his home made 4-4-50 Bordeaux and unless he used materials which would equal this material, which was then standard, he would only then get the same results. This seemed very logical. The material was at this time, as is now, shipped in light steel, air-tight drums. I found that this was necessary because of the peculiar nature of the potato dust. The standard potato dust is made by dehydrating copper sulphate crystals (Blue Stone), baking these crystals in ovens until they become a pure white powder. When this stage is reached all the water contained in the Blue Stone is taken off. This powder, which is called, dehydrated copper sulphate, is then mixed with a high grade lime, processed by air-floating, which has been hydrated. To this arsenate of lead or calcium arsenate is added. When this combination of materials is applied to the plants with moisture on them a true Bordeaux material is manufactured on the plant. The whole plan looked logical and I purchased the best potato duster on the market.

This was the first potato duster to come into our county. At this time I was president of the county potato growers association and an active member in the Farm Bureau. Consequently a close watch was kept on my crop that season. I dusted that season according to the directions given by the field service man of the company from whom I purchased the outfit. The bugs were easily controlled. We did not experience blight that year so I was unable to check its merits from that point of view. However, to my delight and expectation, and to the extreme surprise of my neighbors, I was able to increase my yield as I had done before, (having left a check plat for this reason).

Each season I have conducted tests to prove the method, for my own satisfaction and interest, so that I could feel absolutely sure of it. These tests have been most interesting. Last year I made a test taking two acres, blocking it into five plats, as identical as could be done in a perfectly level field, to these plats were applied different numbers of applications. For instance, in plat No. 1, poison applications were made only to kill the bugs, this was really a check. In plat No. 2 two poison and two regular potato dust applications were made, total of four. These were made at ten day intervals, and so on with plats three, four and five. Each plat receiving two more applications than the other until plat No. 5 got ten

applications. Why did I go to all this bother? For just this reason; to determine if the number of applications were in direct proportion to the increase of yield, and to further determine if there was a point of too many applications which would tend to make the practice unprofitable. The test worked out as I had hoped it would, in fact, to a greater degree of even proportion than I had anticipated. It was interesting to see the plats receiving the less applications die in their turn and to count and weigh the potatoes. I know that I can control all our local insects and prevent the blights, and the increase in yield pays for this protection and returns me dividends besides.

So you see I have a good reason to continue to dust my potatoes after four seasons of personal experience.

CONTROLLING DISEASES AND INSECTS

William Duffy, Hicksville, Long Island, N. Y.

We have used Niagara potato dusters for the last five years on about one hundred acres of potatoes each year. We use Niagara dusts for blight, bugs and aphis, with good results.

For blight control we find it essential to apply the dusts when the plants are wet with dew. We use about thirty pounds per acre on the average, of a copper-lime dust containing 25 per cent dehydrated copper sulphate. When the dust is applied to dry vines, we have noticed that it is not so effective in control of blight, but when applied to damp vines the dust turns to a Bordeaux blue at once, and we have had better results in checking blight than we ever did by spraying.

In controlling potato aphis we use a 3 per cent Nicotine dust when the air is quiet, the vines dry, and if convenient when the temperature is 70 or above. The first two factors are more important than temperature.

THE ORIGIN AND HISTORY OF THE AMERICAN GIANT AND BEAUTY OF HEBRON POTATOES

E. V. Hardenburg, Cornell University

Authentic records of the origin of well-known varieties of potatoes are frequently difficult to obtain. Writers are frequently dependent upon meager information in published form and often must rely upon information obtained either indirectly or directly thru the spoken word. The writer has recently had occasion to trace the origin of the varieties, American Giant and Beauty of Hebron, both of which authorities agree originated in New York State.

American Giant was originated by Mrs. Rachel Campbell of Hebron, Washington County, N. Y., in 1893. The variety was propagated as a chance seedling obtained from a seed ball of a variety called Jackson. Information is not at hand to indicate whether the parent variety is synonymous with Jackson White, a variety listed by Prof. William Stuart in U. S. Department of Agriculture Bulletin 176.

Early Beauty of Hebron was also originated by Mrs. Campbell in 1877 as a chance seedling from the variety Peachblow. Both the early Hebron and the late Hebron represent two varieties out of five originally started as chance seedlings by Mrs. Campbell. Although credit for the origin of these varieties has been given to E. L. Coy, of Hebron, N. Y., he was not the originator but rather the party responsible for having them introduced commercially.

WHAT SHALL WE BELIEVE?

W. Stuart

The American Giant potato was offered to the trade by B. K. Bliss & Sons, one of the most reliable seed potato firms of their day, in their 1881 Potato Catalogue p. 11. The accompanying description is taken from this catalogue. "The American Giant.—One of largest varieties in cultivation, as well as one of the most productive. This fine variety originated in western New York, and it thus described by the raiser: Vines vigorous and healthy, tubers of an unusually large size, grow compactly in the hills, easily dug, cooks well either by baking or boiling, of good flavor, and excellent keepers. It is a second early variety, and matures the crop about two weeks later than the Early Rose." This description is accompanied by a figure showing a tuber over 7 inches in length with numerous eyes. There is every reason to believe that this variety is the one we now know as the American Giant. In view of these facts it is difficult to reconcile the claim made by Mrs. Rachel Campbell that she originated this variety 12 years after it was listed in Bliss & Sons catalogue. Whether or not it had been offered to the trade prior to this date it is impossible to say as no record as to its parentage, originator and date of origin has come to our attention.

According to the Cultivator and Country Gentleman Vol. 45 p. 468, 1880 the Early Beauty of Hebron was originated near West Hebron, Washington Co., N. Y., by E. L. Coy and is claimed to be a seedling of the Garnet Chili variety thereby giving it the same parentage as the Early Rose, at least as regards its mother parent. It was introduced by the well-known seed firm of J. M. Thorburn & Co. of New York City in 1878. The parentage of the Early Beauty of Hebron seems to be further substantiated by the following description which is taken from the 1879 seed catalogue

of J. J. H. Gregory & Son of Marblehead, Mass. p. 55. "Strongly resembles the Early Rose in shape and color, about as early as Early Rose and a much better cropper." In the 1881 catalogue of the same firm, p. 53 the following statement concerning the place of origin of the Early Beauty of Hebron appears: "This potato is a native of Washington Co., N. Y." From the above account it would appear as if published statements of nearly a half century's standing, which so far as is known has never hitherto been questioned, are entitled to very careful consideration, before their rejection. In the first place it is difficult to conceive how a variety claimed by Mrs. Campbell to have been originated as a seedling in 1877 could have been introduced to the trade in 1878. The least possible time from the date of origin to its introduction could hardly be less than three years.

OLD POTATO PRICES DECLINE; NEW STOCK TAKING FIRST PLACE

(Contribution from the Fruit and Vegetable Division, Bureau of Agricultural Economics, U. S. Department of Agriculture)

Old potatoes seem to have lost their grip during early May, and markets were badly slipping. In fact, ever since the extremely high levels of April 10, prices have gradually declined and, during the week ended May 8, the market for old potatoes was much depressed. Fairly heavy receipts and probably inferior quality of many arrivals tended to keep prices down. "Slow, dull, weak" were descriptive terms used by most reporters, and the Philadelphia situation was reported as nearly demoralized. Declines of 50 cents to \$1.00 per 100 pounds were quite general during the week. Eastern cities had dropped back to the level of mid-March. The Chicago carlot market and North Central f. o. b. prices declined sharply to quotations which prevailed in early December. Shippers in Aroostook County, Maine, also reverted to the December price after the extremely high levels attained in April, and western New York f. o. b. quotations were again like those of late March. However, in spite of all this recent reaction, the old potato market has much potential strength and prices still are three or four times those of a year ago. Many dealers believe that the pendulum has swung only temporarily to the side of weakness and that it will swing back again very firmly. In fact, by May 8, both Chicago and Kansas City were stronger and apparently headed for some recovery.

After receiving the heavy supply of 564 cars, Chicago carlot prices of sacked Northern Round Whites reached bottom of \$3.00 on May 7 and then recovered to a range of \$3.25-\$3.50. Elsewhere, this stock was jobbing at \$4.00-\$4.25, and the average price in such

southern markets as Washington and Atlanta was around \$5.00. Minnesota Red River Ohios still showed considerable strength in Cincinnati at \$4.80-\$4.90. The Chicago market was weak on Idaho Russet Burbanks at \$3.00-\$3.25, but this variety ruled \$3.25-\$4.00 in other consuming centers and sold as high as \$5.00 in Pittsburgh and Cincinnati on May 3. The few sales of potatoes made at North Central shipping points ranged \$3.00-\$3.40, with Michigan dealers getting the higher price and Wisconsin the lower. A decline of only 15 cents occurred during this first week of May in western New York, where sacked Round Whites brought \$4.50-\$4.60, but terminal markets for this stock dropped to \$4.00-\$4.85, and Philadelphia dealers received as little as \$3.65. Maine Green Mountains showed a wide jobbing range of \$4.15-\$5.00, while the shipping-point quotations on bulk Green Mountains dropped \$1.20 to a close of \$3.30. New York City received only 155 cars of old potatoes, and Boston 245, including 20 from Canada.

Like the traveler, who has come over a hilly road, looks back to the heights from the valley below, it is of interest to note the actual price declines since early April. Maine potatoes, which have been more abundant than those of any other State, suffered the greatest decline,—about \$2.50 per 100 pounds, f. o. b. Aroostook County points, and about \$1.50 in city markets. Idaho arrivals had dropped \$2.00 in Chicago and \$1.00 in Cincinnati. North Central potatoes registered declines of \$1.75 per 100 pounds at country loading points and in important consuming centers. The month's difference for western New York stock was about \$1.00 or \$1.25. Red River Ohio's showed greatest strength, by staying close to \$5.00 in Cincinnati.

During the opening week of May, the shipments from Maine again increased to 830 cars, which were given wide distribution. Idaho started 280 cars to market, some destined for Atlanta, Ga. Colorado shipped 220 and Michigan 250 cars, no other State reaching 200. Aggregate movement of 2,300 cars of old potatoes was about 300 in excess of the preceding week, but 550 less than a year ago. The season total to May 8 from leading main-crop States was 162,000 cars. Idaho had shipped 8,500 cars since January 1, or 15 per cent more than its estimated merchantable holdings. The April total for all potatoes was around 13,800 cars, as against 19,000 to 20,000 the last two seasons. The March movement was 19,500 cars. About 1,000 carloads came from Canada in April, and the aggregate imports of Canadian stock this season are approximately 7,000 carloads.

New Potatoes Prominent

Many of the southern potato-shipping States were becoming active, and the volume of arrivals is increasing. Florida's 920 cars during the week ended May 8, probably marked the peak movement from that State. About 800 cars were expected during the week

ending May 15 and 500 the following week, with most of the crop out of the way by May 25. This would make a total of about 4,000 cars from Florida, compared with 5,100 last year. Production in the Hastings section of Florida is indicated as 1,800,000 bushels, or 240,000 less than in 1925. Plantings were heavier, but average yield of 100 bushels per acre is 17 per cent below last season's average for that district.

Texas' output in early May decreased to 140 cars and less than 300 additional cars probably will roll from the lower Rio Grande Valley. Like the other States, Louisiana is late this season, but carlot movement has now begun and local estimates of the total expected output range from 1,000 to 1,500 cars. Louisiana shipments were expected to be heavy by May 15, and the crop practically cleaned up by June 5. Alabama's crop is now moving from an acreage about 50 per cent greater than last year. Condition is not quite so good as in 1925, so that the production and carlot output may not be increased more than 25 or 30 per cent. Alabama shipped slightly over 1,000 cars of potatoes last season, beginning about May 1. Movement was completed early in June, but this year it may continue until June 15 or later.

A fine large crop is expected in South Carolina, and first shipments have already rolled. Movement likely will be heavy by May 25, and reach its peak by June 1, at which time the North Carolina crop will start. Oklahoma's potato plantings this year have been increased to 14,500 acres, with the crop in good condition and movement expected to start in the southern part of the State during late May. The northern part of Oklahoma's potato district should begin shipping by June 10. Last spring about 2,400 cars came from that State. Virginia has increased potato plantings over original intentions and now is estimated to have 92,000 acres, as against 86,000 last year. Total commercial acreage in 10 early States is 217,570, or 10 per cent more than in 1925.

Slightly more than half as many new potatoes have been shipped so far this season as to the same time a year ago,—3,300 cars, compared with 6,450 to May 9. Prices are nearly twice as high and have been well sustained. Florida Spaulding Rose, U. S. No. 1 grade, declined only \$1.00 per barrel in the Hastings section during early May, closing at \$8.50. The break did not occur until May 7, when haulings became heavy. Most city quotations were only slightly lower than the previous week at \$10.50-\$11.50, Chicago sales dropping to \$9.75-\$10.00. Texas Bliss Triumphs held firm in the lower Rio Grande Valley at \$5.25, sacker per 100 pounds, with demand and trading good. The jobbing range on this stock showed strength at \$6.00-\$7.50. New York City received 230 cars of new potatoes, or considerably more than of old stock, and Philadelphia took 133 cars during the period May 3-8. Movement of old stock usually decreases from now until the end of the season, and new stock increases. By June 1, more new potatoes than old probably will be rolling to market.

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TO BE OR NOT TO BE?

This is the question we as members of the association must answer. If every member was given a vote on this question they would vote,—“To Be”. This would show that they believe in the activities of the Potato Association of America. It has been demonstrated in this last effort to get new members that entirely too many prefer to,—“Let George do it”. This is merely,—“Passing the buck”. The editor realizes that several are going to make good use of the green application blanks yet. Probably the editor did not make the period long enough. Let us make our slogan,—“**Every member get a new member before July 4th**”. The editor did not find time to write to any one on this subject until May 3, and then sent one letter and two days later received a favorable reply. Every member could do the same. The growers would not have to write letters but simply get their neighbors to subscribe. It is easy and a pleasure to sell anything that is good, like the American Potato Journal, because you know that every reader is going to get more than his money's worth.

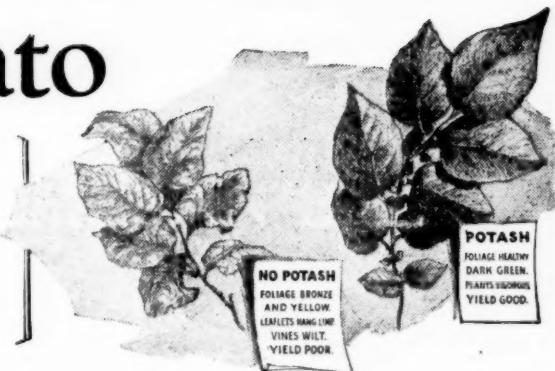
It is usually the busiest people who find time for other things. The first green application blank was received through the efforts of Albert Miller & Co. and the next was from Dr. Donald Folsom, who had secured the membership of County Agent C. C. Farrabee, Dover-Foxcroft, Me. Prof. J. G. Milward has the honor of sending in the largest number of new members and Prof. H. O. Werner was second in the lead. Nebraska is making an excellent showing in membership. If all other potato states had as many members as Nebraska in proportion to the number of bushels of potatoes produced in this state, you would be receiving a **real paper**, and there would be **money** with which to **hire clerical assistance**.

Perhaps only a few of the readers know that Uncle Sam is not furnishing clerical help as in previous years for the Potato Association of America. Thus without money to hire clerical help the editor and business manager, who is also the secretary-treasurer, finds it **physically impossible to do justice to these offices**. The editor and business manager accepted the office of secretary-treasurer only after six weeks had elapsed and no one had accepted the appointment of secretary-treasurership, and with the understanding that sufficient money was going to be raised to hire a clerk and rent an office. At the time the editor accepted the office of secretary-treasurership no notices in reference to dues had been sent out as in previous years.

This brings up another subject, i. e., many have not yet paid their dues this year and have received two notices. This is rather discouraging to one who is laboring under a great handicap and without pay for the work. The editor is doing this work not for money but for the good of the potato industry and would feel fully repaid if there was better cooperation and make the Potato Association of America and the American Potato Journal what they

Potato

plants tell
of their
hunger
with these
symptoms—



91 EXTRA BUSHELS PER ACRE!

The Rhode Island Experiment Station has reported an interesting experiment made with fertilizers on potatoes.

When a complete fertilizer containing 50 lbs. of actual potash was used, the yield was 143 bushels per acre. But note the following:

When a complete fertilizer containing 150 lbs. of actual potash was used, the yield increased to 234 bushels per acre. An increase of 91 bushels per acre for an extra 100 lbs. of actual potash. **Potash Pays!**

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A potato plant suffers in a similar way. Its food must be properly balanced . . . it must have nitrogen, phosphoric acid, and potash in correct proportions.

If nitrogen is lacking the leaves turn yellow and the vines lack vigor. Insufficient phosphoric acid delays maturity.

You first notice signs of potash hunger in the foliage. The leaves develop a bronzed and yellow color; later the leaflets hang limp . . . the vines wilt.

Field demonstrations have shown that complete fertilizers containing 100 to 150 lbs. of actual potash per acre bring good returns.

On this basis at least 1000 lbs. per acre of a high analysis complete fertilizer containing 10% potash, or 2000 lbs. per acre if the potash content is 5%, are required for profitable returns. Many successful growers prefer sulfate of potash in their mixtures!

FREE. Potato growers interested in larger yields per acre will find useful information in the newly revised booklet "Better Potatoes." If you would like to receive a copy just send your name and address to the office below.

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POTASH



should be. The potato industry is a big one when measured in dollars and cents. There is much room for improvement in this industry and it needs a strong national or international organization. If those who are interested in the potato industry do not do more to help themselves, who is going to foster this great and necessary industry as it should be?

New Members

Membership was obtained through the efforts of

Geo. T. Digby, Wheeling, W. Va., Albert Miller & Co., Chicago, Ill.	E. C. Larrabee, Dover-Foxcroft, Me.	Donald Folsom, Orono, Me.
A. W. Goodfellow, Fresno, Calif.	H. G. Zuckerman, Berkley, Calif.	
V. R. Daigle, Shelburne, Vt.	Elizabeth Clark, E. Corinth, Vt.	
Percy C. Carter, Mapleton, Me., Verne C. Beverly, Presque Isle, Me.		
R. J. Gregory, Rodney, Mich.	H. L. Barnum, Cadillac, Mich.	
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W. C. Stauss, Eau Claire, Wis.	" " " "	" "
John Erickson, Waupaca, Wis.	" " " "	" "
Chas. F. Koslowsky, Coleman, Wis.	" " " "	" "
Badger Work Club, Rhinelands, Wis.	" " " "	" "
Aug. F. Ossman, Bradley, Wis.	" " " "	" "
John Coleman, Hay Spring, Nebr.	H. O. Werner, Lincoln, Nebr.	
Val Kuska, Omaha, Nebr.	" " " "	" "
J. M. Tollman, Marshland, Nebr.	" " " "	" "
W. C. Strong, Onley, Va., Walter M. Peacock, Takoma Park, D. C.		

There were several other new memberships sent in during the month and the editor had no evidence by which to credit any member for these.

HISTORY OF VARIETIES

In this number there are two accounts of the development of the American Giant and the Beauty Hebron varieties. The Journal is the proper medium through which to throw light on the history of potato varieties. Very little is known about the developments of several varieties, for example, the Jersey Red Skin. Therefore, the Journal solicits information concerning the history of the potato varieties which are not definitely known. There may be conflicts in the information given of varieties developed a half century ago, but these may serve as guides in search of the truth.

Furthermore, accurate information concerning the development of each potato variety will aid in checking the misnaming of varieties. — **Editor.**

POTATO MEETING

SEED POTATO CERTIFICATION CONFERENCE

On Monday and Tuesday, June 21 and 22, a conference of the seed potato certification authorities of the Eastern States and Can-

POTATO DISEASES

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ada will be held at Freehold, New Jersey, under the auspices of the Potato Association of America. A similar conference held at Freehold last year proved to be very much worth while in that it cleared up some points concerning the various degeneration diseases as well as other matters pertaining to the inspection service. This year it is expected that a number of the inspectors will attend. It is important that as many men in actual charge of the field inspections be present as possible since it is on them that the responsibility falls of accepting or rejecting a field.

This year a much better opportunity will be afforded for the study of the various degeneration diseases. Through the cooperation of E. S. Schultz, A. H. Gilbert, Karl H. Farnow and R. W. Goss a number of samples of diseased tubers have been assembled and planted in tuber units. The following material has been included in the plantings, Mild and Rugose Mosaic, Spindle Tuber and Leaf Roll on Green Mountains from Maine; Mosaic, Spindle Tuber and Giant Hill on Green Mountains from Vermont; Leaf Roll, Spindle Tuber, Mosaic and Yellow Dwarf on Green Mountains from New York, and a miscellaneous lot from the Nebraska conference. A fairly extensive planting of each of these various lots has been made so that a good opportunity should be afforded for their study.

The program for the conference will be sent out in the near future. In the meantime, the Committee would appreciate hearing from those who plan to attend.

Wm. H. Martin, Chairman
 H. T. Gussow
 Karl H. Farnow
 H. O. Werner
 J. E. Currey

POTATO NOTES

Colorado.—There is practically no market for potatoes in the Greeley district at the present time. Some dealers are quoting \$2.50 per cwt. and but few sales are being made. There are probably 300 cars of potatoes left in the Greeley District and many growers are holding for a higher market. It looks rather doubtful at the present time whether there will be a comeback in the market and it is possible that some potatoes will have to be dumped at the end of the season. Of course this is a matter that will only be determined by the condition of the market during the next few weeks. It is believed that there has been an increase in the early plantings of the district although the exact acreage is not known at this time.—**W. C. Edmundson, May 3.**

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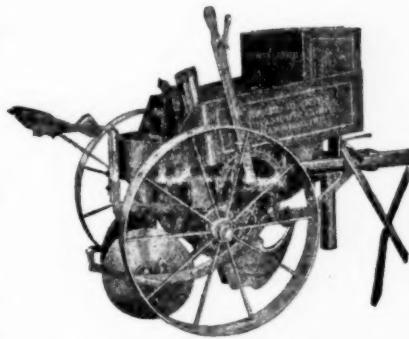
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Connecticut.—As the season is at least two weeks behind normal this year, it is rather early to estimate the acreage of potatoes planted in Connecticut, at this time. However, the farmers who make more or less a specialty of raising potatoes are planting practically the same area as in 1925. Although I have no data to substantiate the belief, I think that the one and two acre growers and gardeners will pay more attention to potatoes this season due to the prevailing high prices of table stock, which is now about \$3.50 per bushel.—**B. A. Brown, May 10.**

Kansas.—Kaw Valley potatoes were mostly planted by the 25th of March. Since then, heavy snows, rains, and cold days have prevented further planting. Most growers were finished planting or had only a few acres left to plant before the snows came.

The acreage is slightly less than last year. In 1926 there are approximately 16,500 acres. The prolonged cold wet weather will no doubt cause a ragged stand in some fields. The season at present is considerably behind last year. However, the warm days in May and June may easily push the crop along so that it can be dug as usual beginning about July 1.

A number of potato growers have planted Bermuda onions this year. This is more or less an experiment with them. Nearly every section of the state is trying them.—**E. A. Stokdyk, April 6.**

Maryland.—I returned from the Eastern Shore yesterday and I am glad to state that the early potatoes in Worcester County have come up and the stand is exceptionally good. The reports as to the acreage are rather conflicting but it seems that there is a slight increase in acreage over last year. More northern grown seed has been used in proportion to the home grown this year as compared with the past several seasons.—**Fred W. Geise.**

Michigan.—It is impossible to tell at this time what the potato acreage will be this season in Michigan. Our average acreage for the past ten years has been approximately 319,000 acres. Last year there were 237,000 acres. Usually, years of high priced potatoes have generally resulted in greatly increased potato acreages. It is expected that there will be a material increase this year. The price of beans has not been very satisfactory during the past season and many growers may substitute potatoes for beans this summer.

Michigan growers are being cautioned not to increase their potato acreage on the basis of anticipated high prices. Emphasis is being placed upon the growing of better market quality stock and the production of better yields.

The market for certified seed has not been quite as active this season as in past years. It is believed that the general high prices for table potatoes has interferred some with the selling of large quantities of seed. In many cases growers sold table potatoes last fall at relatively low prices and they are not willing to pay high prices at this time for seed. Most of them are using their own stock which might have been grown from certified seed a year or two ago.



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ON PAGES 93 to 96 of the March 1926 issue of the "American Potato Journal," there appeared a description of a new and extremely effective treatment with Du Pont Semesan Bel for preventing or controlling the common seed-borne diseases of potatoes. This modern method of disinfecting seed potatoes should appeal to every farmer because it eliminates the time-consuming liquid treatments with mercuric bichloride or formaldehyde and allows instantaneous application in either the dust or liquid mixture forms.

Semesan-treated potatoes captured the Idaho State Crop Record during 1925 with a yield of 862.5 bushels per acre, which was obtained by Mr. Walter Coiner of Hansen, Twin Falls County, Idaho. Moreover, of last year's four heaviest yielding potato crops in Southern Idaho, a district noted for the quality and size of its potatoes, three of them were grown from Semesan-disinfected seeds. In producing yield increases Semesan Bel far surpasses the old type disinfectants.

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{ The Idaho Agricultural Experiment Station reported that Semesan Bel: ". . . when applied to the uncut presprinkled tubers (potatoes) at the rate of three ounces to the bushel gave better control under field conditions than any other treatment tested." The New Jersey Agricultural Experiment Station confirmed the Idaho results.

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In Michigan, considerable interest is being shown this season by various commercial organizations such as Rotary Clubs, Kiwanis Clubs and others in the fostering of potato clubs. Several carload lots of certified seed have already been placed for such work. Help in conducting field meetings, demonstrations, etc., will be given during the season by the Potato Specialists of the College.

No material increase is expected in the acreage planted for inspection and certification this season in Michigan. The varieties that will be the most extensively planted are Russet Rural; White Rural; Green Mountain and Irish Cobbler.

Mr. C. M. McCrary, formerly County Agricultural Agent of Alpena, Michigan, was recently appointed as Potato Specialist at the College. Mr. McCrary succeeds Mr. J. W. Weston who resigned last fall to accept a position with the Missouri Pacific Railroad Company.

Within a few weeks I will probably send you a list of associate members.—**H. C. Moore, May 7.**

New York.—On account of prolonged low temperatures through the month of April seriously holding up plowing and other field operations, potato planting will presumably be from two to three weeks later than normal. This applies to both Long Island and up-state New York.

Indications point to a somewhat reduced acreage on Long Island owing to the fairly general increase in real estate developments in both Nassau and Suffolk Counties. The prospective acreage up-state New York will probably be about the same as that of 1925. The high cost of seed and the lateness of the season will probably combine to prevent any increase which might be expected because of the present high potato prices.—**E. V. Hardenburg, April 27.**

New Jersey.—The intended plantings for New Jersey was 85 per cent as compared with the 1925 acreage. In that year 57,000 acres were harvested as compared with 67,000 in 1924. The planting of the crop this year was delayed on account of the very cool spring. The plants are just coming up. No reports have been had concerning the rotting of the seed piece; the cool weather coupled with the fact that there has been very little rain since planting no doubt accounts for this.

Although unusually high, certified seed was used almost exclusively this spring. In this connection it is interesting to note that approximately 125 cars of certified seed from one section were planted this year. This seed was introduced into the state 5 years ago when one sack was planted in the seed source tests conducted in central New Jersey.

Potato spraying promises to be more generally adopted than ever before. A number of spray rings have been organized and in one community 6 sprayers have been purchased. The growers have come to realize that unless the vines are protected from diseases

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You, too, will be amazed at what the new improved Pyrox spray will do for your crops. We've made it easier to prepare for use. Five minutes and you're ready to spray. No fuss, no bother. It goes farther and IT STICKS -- making frequent sprayings unnecessary. And because it improves foliage it lengthens growing periods and increases crop yields.



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and insects, particularly the leaf hopper, they are unable to produce a profitable crop.

A three hundred bushel club is being inaugurated under the auspices of the New Jersey State Potato Association. Those growers who produce 300 bushels of U. S. Grade No. 1 potatoes per acres on 5 acres will be entitled to membership in the club.—**May 12.**

Ohio.—The importations of certified seed potatoes into the state are much smaller than they were last year. The counties that ordered 6 to 8 cars last year here are getting from 1 to 3 cars this year.

Potatoes are now being planted in the sections where late potatoes are planted early, altho the potato growers in Northeastern Ohio very generally plant their late potatoes in June.

After a cold, somewhat wet April, we are now having warm, dry weather and it is possible for farmers to work the land satisfactorily. In fact rain is needed.—**Earl Jones, May 10.**

Virginia.—During the past month there has been almost continuous cold, backward weather which greatly retarded the growth of the crop. On April 20 the temperature fell below the freezing point and in most places the ground was frozen quite solid and the few potatoes which had appeared above ground were frozen. Probably not over two per cent of the crop was injured. Very few potatoes appeared above the ground until the very last days in April, and at this time, May 3, the greater portion of the potatoes in this section are visible above ground. To date the crop is some two or three weeks later than normal. The stand secured is almost perfect throughout the potato section and very few cases of rot have been reported to the Experiment Station this season.—**H. H. Zimmerly, May 3.**

Washington, D. C.—The growers will be interested in learning the wholesale and retail prices of potatoes in the capital city. This morning the editor walked through the wholesale and retail markets in this city and learned much to his surprise that old spuds were bringing nearly as much as new ones. Wholesale prices:—(old) Rurals, \$8.00 per 150 lb. sack, (new) Spaulding Rose, \$4.00 per bu. and \$11.00 per bbl., (new) Triumphs, \$3.50 per bu. and \$7.00 per 100 lb. sack. Retail prices:—(old) Rurals and Jersey Red Skins were selling at 4 lbs. for 30 cents, and new potatoes, U. S. No. 1, 3 lbs. for 25 cents. The Jersey Red Skins were being sold under the names of Irish Cobblers and Early Roads (Early Rose). This gives the growers a slight idea of what some of the retailers know about potatoes and how the consumers get rid of their greenbacks.

There has not been sufficient amount of rain at any one time here, (Arlington Experimental Farm, Va.), to form a crust on the ground since the potatoes were planted on the 13th of April. At present it is hot and all signs of rain seem to fail.—**Walter M. Peacock, May 10.**

NOTES ON RECENT LITERATURE

BUSHNELL, J.—Seed potatoes for northern Ohio.—*Ohio Sta. Bimo. Bul. 11* (1926), No. 2, pp. 60-64, fig. 1.

In four seasons' tests at the Ohio Experiment Station certified seed potatoes (Rurals) have been consistently satisfactory. Rural Russets from Michigan, the standard for comparison, have on the average outyielded White Rurals from other northern states. Considerable of the seed certified in Ohio is of later maturing types than the standard in the northern states. Such later-maturing strains in three seasons outyielded and in one season made slightly less than the Russet Rural from Michigan. Tubers hill-selected from a crop grown from certified seed were very satisfactory in two seasons and in the third were highly diseased. It appeared to be speculative to plant uncertified seed even from fields grown from certified seed.—H. M. Steece.

MILES, H. W. AND B. THOMAS.—A preliminary study of the relationship between fertilizing and susceptibility to disease in potatoes.—*Jour. Agr. Sci.* 15 (1925), pp. 89-95; *abs. in Chem. Abs.*, 20 (1926), No. 3, p. 471.

Influence of nitrogen, potassium, and phosphorus compound fertilizer and gypsum upon potatoes was studied. Excessive nitrogen applications favor the incidence of disease in this crop. The quantity of nitrogenous fertilizer applied may be regarded as excessive only when not balanced by adequate amounts of potassium. Also the capacity for resistance varies directly with the quantity of potassium. Some of the forms of potassium are more effective than others. Heavy dressings of a well balanced compound fertilizer tend to increase the immunity of the crop to disease.

MOORE, H. C.—Certified potato seed.—*Michigan Sta. Quart. Bul.*, 8 (1926), No. 3, pp. 112-114.

The author indicates that growers may increase the yield and improve the quality of their potato crop by planting certified seed. The rules and regulations governing the inspection and certification of Michigan seed potatoes for 1925 are outlined.—H. M. Steece.

MOORE, H. C.—Hollow heart of potatoes.—*Michigan Sta. Quart. Bul.*, 8 (1926), No. 3, pp. 114-118.

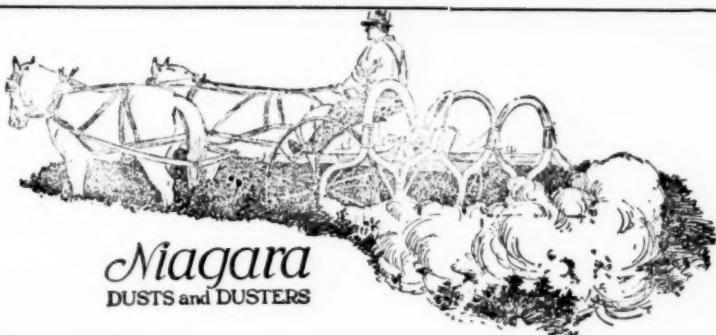
The losses caused by hollow heart, and the possible causes and preventative measures are discussed and an account is given of experiments at the Michigan Experiment Station. Potato hollow heart, characterized by a lens shaped hole surrounded by brownish discoloration of the flesh at the center of the affected tuber, is well known to growers, dealers, and consumers. Hollow heart is not caused by fungus or bacterial pathogens, but seems to be a physiological trouble due to conditions favoring excessively rapid development of the tuber. Doubtless the amount and distribution of rainfall during the growing season bear directly on tuber development and the presence or absence of hollow heart. In 1924, a wet year, this disorder was of serious importance in all sections of

Michigan, although in 1925 it was of little consequence and was restricted to a few sections.

Further evidence that rainfall is an important factor in causing hollow heart was obtained from a field experiment in the summer of 1925 in which four plots of potatoes were irrigated with an automatic sprinkler, while the remaining four plots received no irrigation. Irrigated plots of the May 30 planting averaged 10.37 per cent of hollow heart compared with 1.09 per cent for plots not irrigated. In the June 25 planting the irrigated plots averaged 3.81 per cent hollow heart and plots not irrigated 0.85 per cent. In both early and late plantings irrigated plots outyielded those not irrigated. In the early planting the average tuber size and the percentage of oversized potatoes were greater in the irrigated plots. Potatoes of the late planted plots averaged 2.2 oz. smaller than those in the early planting and had no appreciable amount of oversized tubers.

In this experiment, the 36 by 18 in. spacing gave average increases in yield over the 36 by 36 in. spacing of 34.6 per cent for the early planting and 18.1 per cent for the late planting. The average percentage of hollow heart in the early planting with 36 by 36 in. spacing was 9.35 compared with 2.65 per cent for the 36 by 18 in. spacing. In the late planted the average percentages of hollow heart were 3.39 and 1.26, respectively. This should be significant to potato growers since this result apparently indicates that closer spacing reduces the amount of hollow heart and increases the yield. During the 1924-1925 shipping season, when 95 lots of certified Russet Rural seed potatoes were examined for hollow heart, those lots showing the least hollow heart generally came from fields where close spacing was practiced. Fields in which the feeding area per hill was greater than 600 sq. in. had the largest number of lots showing hollow heart. In this study it was found also that the amount of hollow heart varied inversely with the percentage of stand. Where there was a 90 per cent stand or better, there was considerably less than the average amount of hollow heart.

At present there is no evidence to indicate that hollow heart is hereditary or confined to certain strains. Throughout the Northern States, potatoes of the Rural type are the most severely affected, along with Irish Cobbler, Early Ohio, and Spaulding Rose. Green Mountain, Russet Burbank, Triumph, Peach Blow, and Downing are generally very free from hollow heart. Counts on hollow heart, made when cutting the seed for strain tests in 1925, showed approximately the same percentages of hollow heart in Russet Rural, White Rural, and Irish Cobbler. The few lots of Green Mountain seed cut had no hollow heart. Pending further studies, it is believed that hollow heart in Michigan potatoes can be materially reduced if growers will follow cultural methods generally recommended for the production of good yields of high quality potatoes.—**H. M. Steece.**



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DUSTS and DUSTERS

MOORE, H. C.—Handling seed potatoes.—*Michigan Farmer*, 164:18, May 1, 1926.

The author advocates the use of carefully selected seed preferably certified seed; the treatment of seed with corrosive sublimate, 4 oz. to 30 gals. of water for 30 minutes for the control of scab, rhizoctonia and blackleg. He cautions the users of corrosive sublimate about keeping up the strength of the solution by adding 1 oz. of the chemical every second treatment to 30 gals. of water. The use of wooden or earthen vessels is recommended. Since corrosive sublimate is a deadly poison the treated potatoes should never be used for eating purposes, nor the solution poured where the livestock can get it. The treating should be done while the tubers are dormant and before they are cut. The treated tubers should be dried quickly and if only two or three weeks before planting time they should be placed in a light room at a temperature of about 60 degrees Fahrenheit. This green sprouting gives the grower a chance to recognize and discard those tubers producing weak sprouts.—Walter M. Peacock.

THOMAS, B.—Fertilizing in relation to the disease resistance of crops.—*The Fertilizer, Feeding-Stuffs and Farm Supplies Journal* 10 (1925), pp. 487, 488: *abs. in Chem. Abs.*, 20 (1926), No. 3, p. 471.

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In one experiment the percentage of healthy potato plants was increased from 42.7 on control plats to 54.1 on plats receiving potassium sulphate at the rate of 200 lbs. per acre. In another experiment the percentage increased from 28.5 to 58.8. The lower grade potassium salts were much less efficient in this respect than either the chloride or sulphate. Application of superphosphate at the rate of 600 lbs. per acre to a soil already containing unusually large amounts of available phosphoric acid decreased the percentage of healthy plants from 59.6 on the control plat to 26.6. Although an excess of nitrogen usually decreases the disease-resisting powers of plants, a progressive increase in the percentage of healthy potato plants was obtainable with applications of ammonium sulphate up to 800 lbs. per acre supplied as a balanced fertilizer with potash and superphosphate. Potash is the determining factor in promoting the disease resistance of plants. Nitrogen and phosphoric acid, particularly the former, are liable to exercise an adverse effect when used in excessive amounts. Each variety of plant has a certain definite ratio of potassium, nitrogen, and phosphoric acid which is the optimum for increasing its disease-resisting powers. The importance of maintaining this ratio is emphasized.

WEDGEWORTH, H. H. AND C. B. ANDERS.—Value of certified Irish potato seed in Mississippi.—*Mississippi Sta. Circ.* 60 (1925), pp. (4), fig. 4.

Certified seed from Nebraska and Wisconsin produced higher yields and better stands and had low percentages of mosaic in comparison with local uncertified stock, in trials at the Raymond Branch Experiment Station.—H. M. Steece.

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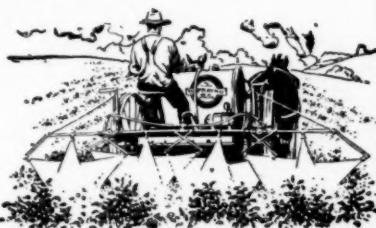
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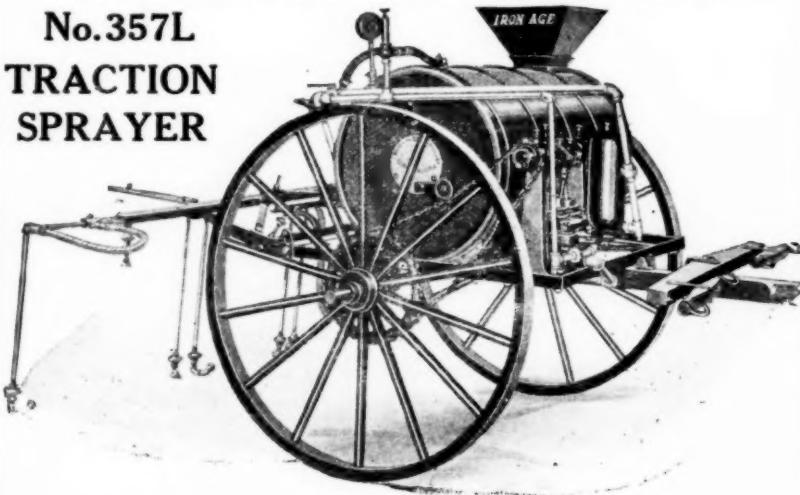
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